

**FluoroSELECT® Fluorometer**  
**User's Manual**  
**Version 4.4.A**

Sigma-Aldrich Chemie GmbH  
Industriestrasse 25  
CH-9470 Buchs  
Switzerland

EurTechServ@sial.com  
techservice@sial.com (US and Canada)

**sigma-aldrich.com**

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## 1. FluoroSELECT® Fluorometer

### 1.1 Overview

The FluoroSELECT® fluorometer is a portable instrument designed for multipurpose fluorescence measurements. The instrument is simple to use, light in weight, and can be powered by either DC power adaptor or battery, making it an excellent choice for field studies and laboratory measurements.

### 1.2 Key Features

- a. Using either 200 µL PCR tubes or glass mini-tubes. Only 100 µL is required for detection using glass mini-tube as sample carrier.
- b. LCD touch-screen display.
- c. User-friendly software with “touch and test” operation.
- d. USB interface for data management.
- e. Compact and robust.
- f. Larger than 6 logs of dynamic range with proper calibration procedure.

### 1.3 Packing List

- a. The FluoroSELECT® fluorometer.
- b. 5VDC power adapter.
- c. USB cable.
- d. Operation manual and USB driver/data management software CD.

### 1.4 Battery Installation

- a. Slide off the battery compartment cover on the back of the instrument.
- b. Install 4 AA alkaline batteries into the appropriate spaces with correct polarizations.
- c. Slide on the battery compartment cover.

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## 2. System Operation

### 2.1 Power Up

The FluoroSELECT® Fluorometer can be powered with 4 AA alkaline batteries or a power adapter (5VDC). Switch the ON/OFF button to turn on the fluorometer. After a flash of welcome screen, similar to the one shown in Figure 1, the screen automatically turns into the “**Main Menu**”, as shown in Figure 2.

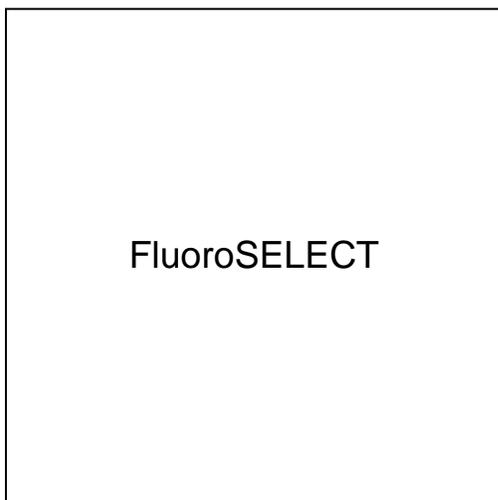


Figure 1. Welcome screen

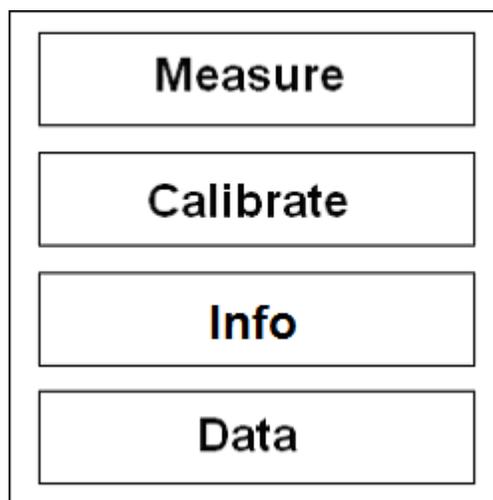
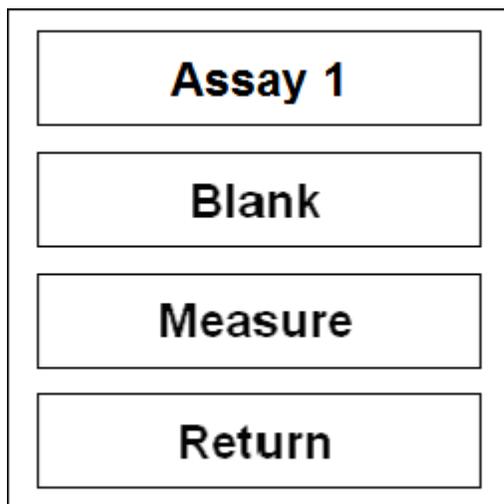
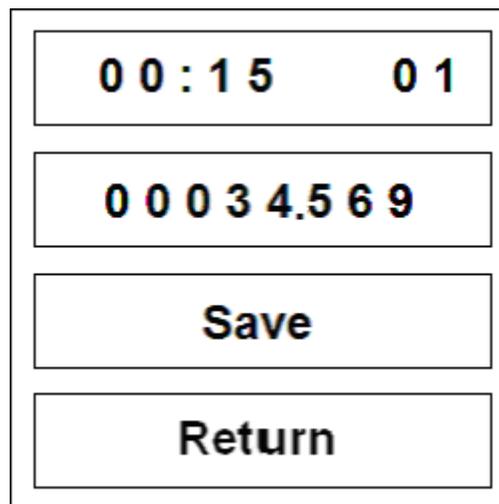


Figure 2. **Main Menu** screen

### 2.2 Measurement

- a. Refer to Section 2.3 for calibration procedures if the fluorometer has not been calibrated against the assay standard to be measured.
- b. Touch “**Measure**” tab on the “**Main Menu**” screen to enter the assay selection screen. In the screen you can select Assay 1, 2, or 3. This selection will measure the sample and calculate the nominal concentration value using the standard value that you performed in the calibration steps. You can also touch “**Next**” to enter the next screen and select “**RFU Hi**” or “**RFU Lo**” function, which gives you the “Relative Fluorescence Unit”, or simple photodetector reading that is produced by “High” or “Low” optical excitation power, respectively.

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- c. Referring to Section 3, prepare the sample and/or blank tube, insert into the test chamber, and secure the chamber cap.
  - d. If PCR tubes are used, align the cap-lip with the chamber mark so each time the measurement is consistent.
  - e. After the assay selection you will enter the “**Measure**” screen similar to Fig. 3.
  - f. If you performed the calibration procedure (Section 2.3) longer than 1 hour ago, you can perform another blank procedure to reset the back-ground level in order to achieve better accuracy for low-concentration samples. Insert the blank tube, and touch “**Blank**”. After the blank reading is done, it will return back to the “**Measure**” screen.
  - g. Insert the sample tube and secure the cap. Touch “**Measure**” tab to start measurement. The measurement result will be displayed on the “**Result**” screen in a few seconds, as shown in Figure 4 (the decimal point may be located at different position depending on the model). The timer clock will start from zero so you can do a follow-up measurement after a certain time.
  - h. If you want to save the measurement data in the meter’s on-board memory, you can touch the “**Save**” tab. The data will be saved in the memory of the specific “Assay” that you selected earlier, with the data sequential number displayed on the upper-right corner.
  - i. If the reading is too high and saturates the photo-detector, an “**Over Limit**” message will display.
  - j. Touch “**Measure**” tab will repeat the measurement. The timer clock will restart from zero.
  - k. If batteries are used as the power source, and the voltage has dropped too low and the accuracy of the measurement may be affected, a “**Battery Low**” warning message will show on the bottom of the screen during measurement. The batteries should be replaced as soon as possible.
  - l. Touch “**Return**” tab will return to “**Measure**” screen, and touch “**Return**” again will go back to the “**Main Menu**”.

Figure 3. **Measure** screenFigure 4. **Result** screen

## 2.3 Calibration

- Referring to Section 3, prepare a blank tube, and a standard tube whose value is within the linear range of the target fluorescent material, and is any of the selectable standard values in Step (e). We recommend the standard value be close to the upper-end of your detection range in order to achieve maximum accuracy at low concentration.
- Touch “**Calibrate**” tab on the “**Main Menu**” screen, then touch “**Continue**” to enter the assay selection screen. In the screen you can select Assay 1, 2, or 3 on which you want to calibrate your standard.
- After you select the assay and enter the “**Calibrate**” screen, as shown in Fig. 5, put in the blank tube in the sample chamber. Touch “**Blank**” to take the blank value.
- After the blank is read, the screen will become the one shown in Fig. 6.
- To set the value of the standard you will use to calibrate the fluorometer, use the “<” and “>” arrow keys on the second row to move the underline and select the digit you want to change, and use the “+” or “-” keys to increase or decrease the value of the underlined digit.

- f. Once the standard value is set, touch the **“Measure”** tab to take the measurement, then **“Calibration Finished”** will show on the screen. Press **“Return”** to go back to **“Main Menu”**. (Note: if a zero-value is set for the standard, the fluorometer will not perform the **“Measure”** step until a non-zero value is set.)
- g. If the Standard measured value is equal or less than the Blank, an error message **“Reading Too Low!”** will show. Prepare the right standard tube and measure again.
- h. Once the calibration is finished, the calibration value will remain in the meter after it is turned off. If you want to take more measurements of the same target material later, you don't need to calibrate the meter again, as long as the ambient temperature remains similar to that when the calibration was performed. But we recommend perform a **“Blank”** procedure as described in Section 2.2.f before you do the new measurements.

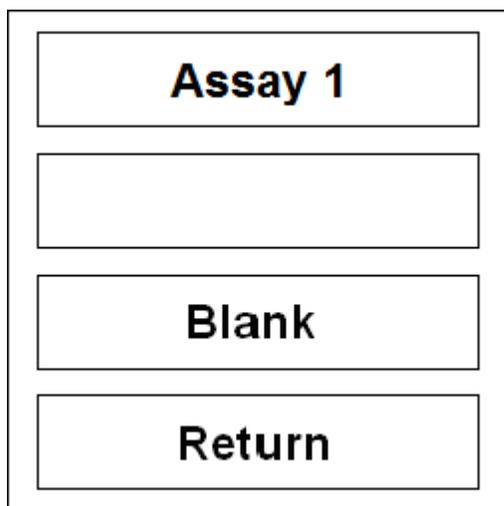


Figure 5. Calibrate screen

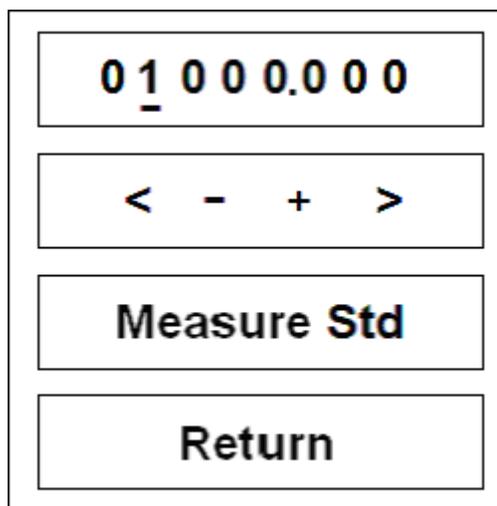


Figure 6. Standard setting screen

## 2.4 Data Retrieval

- a. Touch **“Data”** tab on the **“Main Menu”** screen will let you select the assay in which you want to inspect the data. The **“Data”** screen now shows similar to Fig. 7. The first row shows the saved data, and the second row shows the data sequential number. You can touch the left and right arrow key to change the data number to inspect other saved data.

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- b. If you want to erase the saved data of the assay you are inspecting now, touch **“Erase All”** and confirm the action in the next screen. The data of the other assays will not be affected by this erase.
  - c. Touch **“Return”** tab will return to **“Main Menu”** screen.

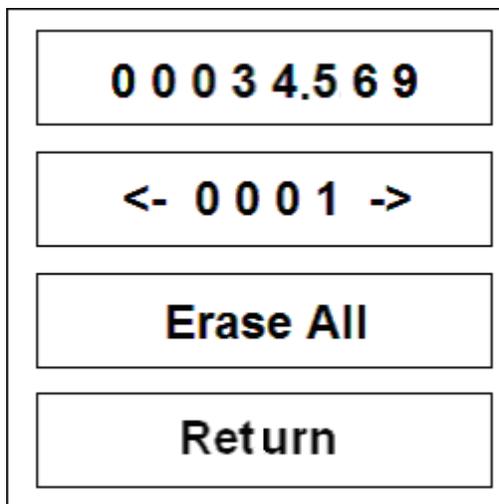


Fig. 7 **“Data”** screen

### 3. Sample Preparation and Measurement Tips

- a. Prepare sample solution within the concentration range that can be read by the fluorometer. You can use the **“RFU Hi”** or **“RFU Lo”** mode in the **“Measure”** function to measure the sample if you are not certain.
- b. Make sure the sample tube is clean internally before you put in the solution, and the outside of the tube is clean and dry. Any materials on the outside of the tube may cause measurement error.
- c. If PCR tube is used, fill the tube with 200µL sample solution or to minimal 80% of the tube height. For glass mini-tubes, 100µL sample solution is needed.
- d. Make sure no bubbles are in the sample solution.
- e. Using the glass mini-tube is better for samples that will be excited by UV (360nm model).
- f. If PCR tubes are used, align the cap-lip with the chamber mark so each time the measurement is consistent.

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- g. Allowing more than 10 seconds between each measurement can minimize the thermal build-up of the light source and maintain the measurement consistency.

#### **4. Maintenance**

- a. Avoid over-filling the test tube and contaminate the outside wall of the tube. If the contamination is transferred to the inside wall of the test chamber, it may cause increased signal level and hence reading error. If this happens, use a cotton swab with clean water or alcohol and gently clean the inside wall of the test chamber.
- b. The touch screen can be periodically cleaned with alcohol or mild detergent.
- c. If the meter will not be used for a period of time, remove the battery from the battery compartment before put into storage.
- d. Always turn off the meter after use if the battery power is used.

#### **5. Fluorometer Data Manager Application Program**

##### **5.1 System Requirement**

The minimum requirements for the computer are listed below:

OS:	Microsoft Windows 2000/XP/Vista/Windows 7/8/10
CPU:	Pentium 4 or later
RAM:	512 MB, recommend 1GB or higher
USB Port:	USB 2.0

##### **5.2 Software Installation**

- a. In order to use Fluorometer Data Manager application program, you may need to have the .NET framework version 2.0 or higher version installed on your computer. You may already have the .NET framework installed on your PC, especially if you have already installed other applications, which were built with one of the Visual Studio 2005 .NET languages. If you do not yet have it, the .NET framework can be freely downloaded from Microsoft's website. Users of Windows Vista do not need to install the .NET framework, as it comes pre-installed as part of the OS.

- b. You also need to install the Microsoft Visual C++ 2005 Redistributable Package "vcredist.exe", which is included in the installation package. Double click "vcredist\_x86.exe" and follow the instructions displayed during the installation, as shown in Figure 14.

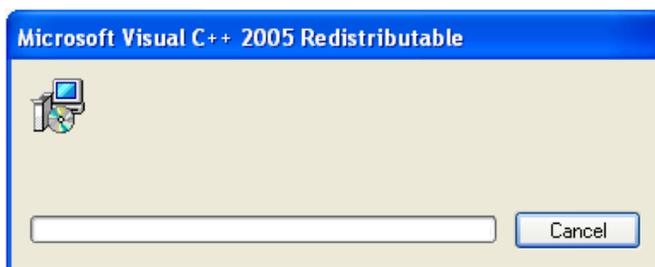


Figure 14. Install Microsoft Visual C++ 2005 Redistributable package

- c. Double click "Setup.exe" in the installation package and follow the instructions displayed during the installation to install "FluorometerDataManager.exe" on the host computer, as shown in Figure 15. By default the data manager program will be installed in the directory: C:\Program Files (x86)\Fluorometer\Data Manager - User\. A "Data Manager - User (Active)" shortcut will also be created on the computer Desktop.

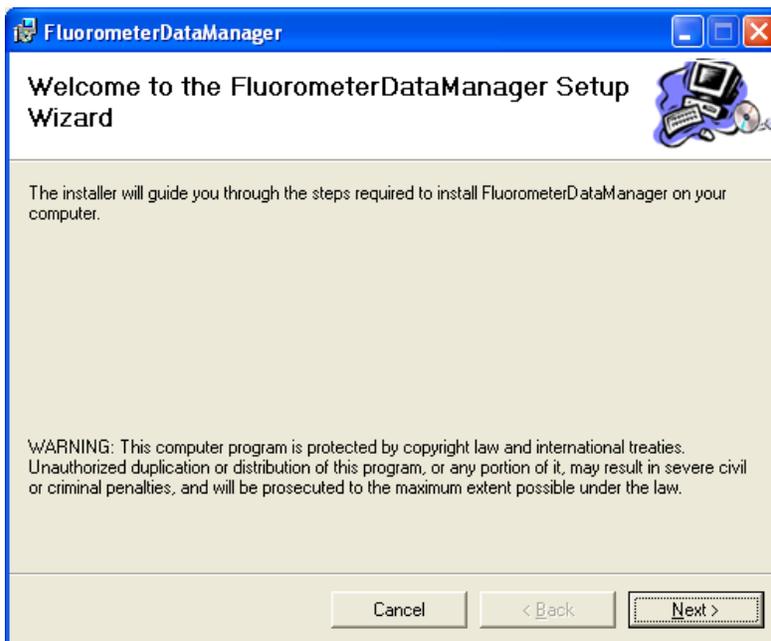


Figure 15. Install Handheld Fluorometer Data Manager

- d. Connect the fluorometer to the USB2.0 port of the host computer with a USB cable.
- e. The “**Found New Hardware Wizard**” window will pop up, as shown in figure 16. Select “**No, not this time**” and click “**Next**” button.
- f. If the “**Found New Hardware Wizard**” window does not pop up, go to Step k to install USB driver manually.
- g. In the next window, as shown in figure 17, select “**Install from a list or specific location (Advanced)**”, then click “**Next**” button.
- h. In the next window, as shown in figure 18, check “**Include this location in the search**”. Click “**Browse**” to find in the folder of installation CD “**\USB Device Drivers**”. Then click “**Next**” button.
- i. In the next window, as shown in Figure 19, Windows will search and download the USB driver for the fluorometer into the operating system.
- j. In the next window, as shown in Figure 20, click “**Finish**” button to complete the USB driver’s installation.



Figure 16. “Found New Hardware Wizard” window, step 1

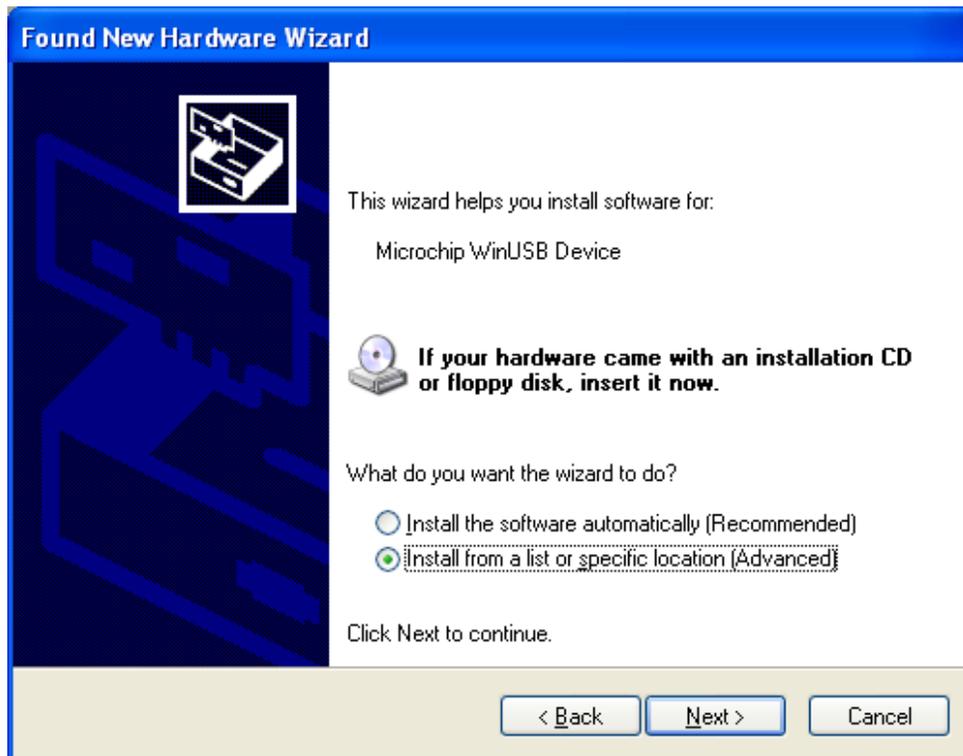


Figure 17 “Found New Hardware Wizard” window, step 2.

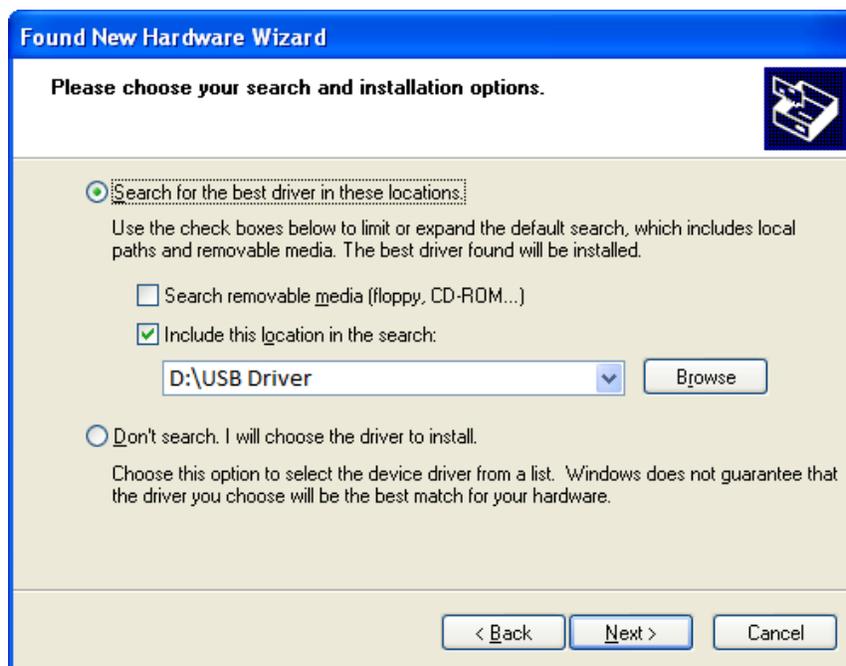


Figure 18 “Found New Hardware Wizard” window, step 3.



Figure 19 “Found New Hardware Wizard” window, step 4.



Figure 20 “Found New Hardware Wizard” window, step 5.

- k. If “**Found New Hardware Wizard**” window does not pop up, try to jump to Sec. 5.4 to start the Application Program and see if the fluorometer can be recognized by the computer.

If not, click , select  tab, right click to get drop-down menu, select “**Manage**” tab to bring up “**Computer Management**” window.

- l. Expand tab “**Device Manger**” and then “**Universal Serial Bus controllers**”, right click  to bring up drop-down menu, select “**Update Driver...**” tab to invoke “**Hardware Update Wizard**” window. Follow the instructions from Step e to Step j to install USB driver.
- m. After the USB driver installed successfully, the “**Computer Management**” window will show as Figure 21.

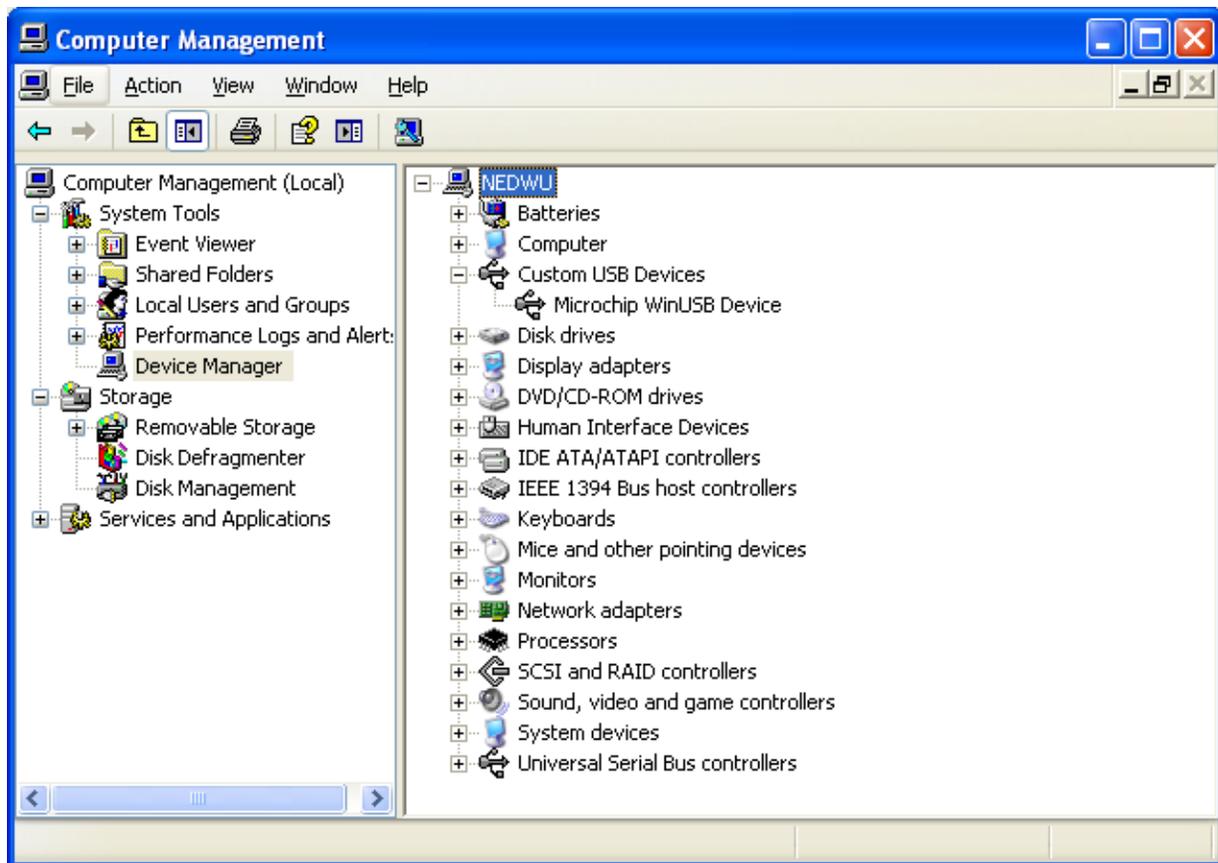


Figure 21 “Computer Management” window.

### 5.3 Uninstall the Handheld Fluorometer Application Program

- Click , and then click  to get “**Control Panel**” menu.
- Double click  tab in the “**Control Panel**” menu to get “**Add or Remove Programs**” window, as shown in Figure 22.
- Find “**FluorometerDataManager**” tab and click “**Remove**” button to uninstall the application program from the host computer.

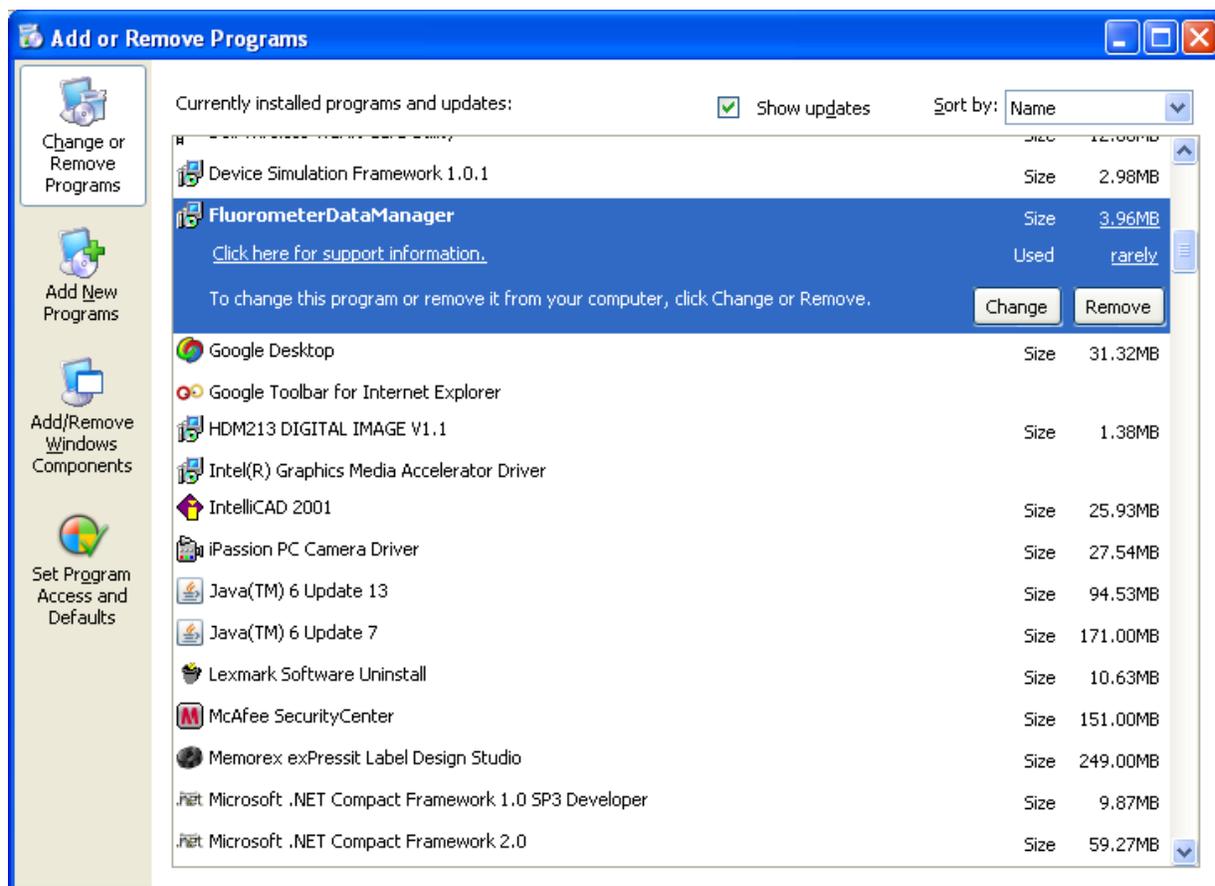


Figure 22. Uninstall Handheld Fluorometer application program

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## 5.4 Handheld Fluorometer Application Program

- a. Double click “**Data Manager - User (Active)**” shortcut icon on Desktop to bring up “**Handheld Fluorometer Data Manager**” window, as shown in Figure 23.
- b. Click “**Connect**” button to set up the USB communication between the fluorometer and the host computer. After connected successfully, “**Read All Data**”, and “**Erase All Data**” buttons are enabled.
- c. Click “**Read All Data**” button to read and display all saved data in the fluorometer as shown in Figure 24. The example shows that Assay#1 has 2 data points, Assay#2 has 3, and Assay#3 has 2 stored in the memory.

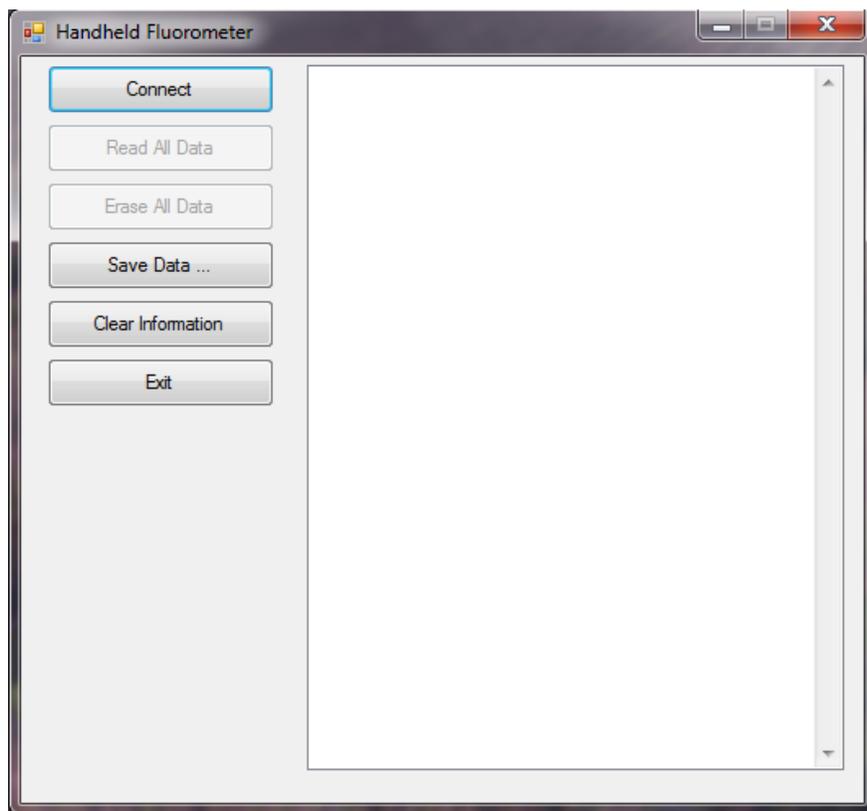


Figure 23. Fluorometer Data Manager window.

- d. Click “**Erase All Data**” button to erase all saved data in the fluorometer.

- e. Click **“Save Data”** button to bring **“Save As”** window as shown in Figure 25. Type in the file name to save data into \*.csv format file which can be opened in Microsoft Excel spreadsheet.
- f. Click **“Clear Information”** button to clear all contents shown in the Window.
- g. Click **“Exit”** button to terminate Handheld Fluorometer Data Manager application program.

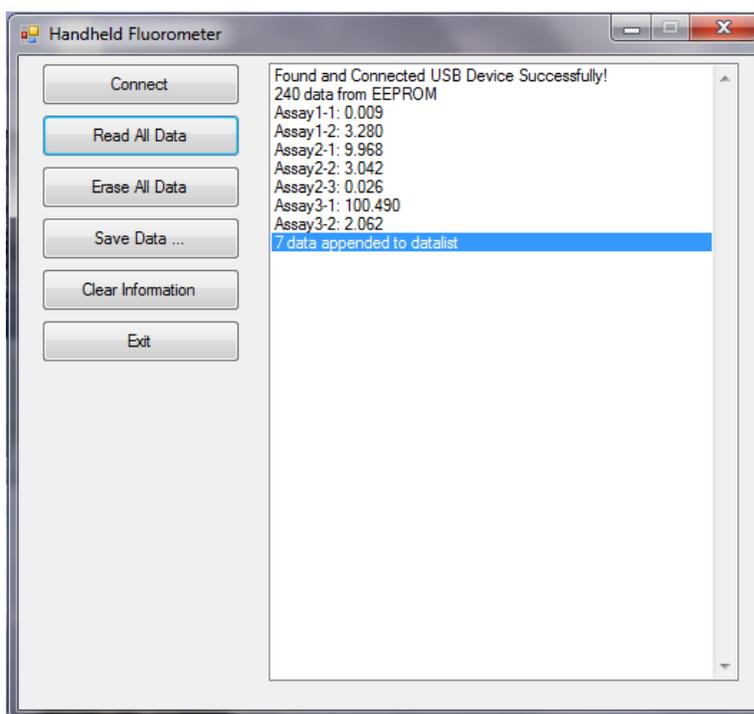


Figure 24. Access and manage saved data

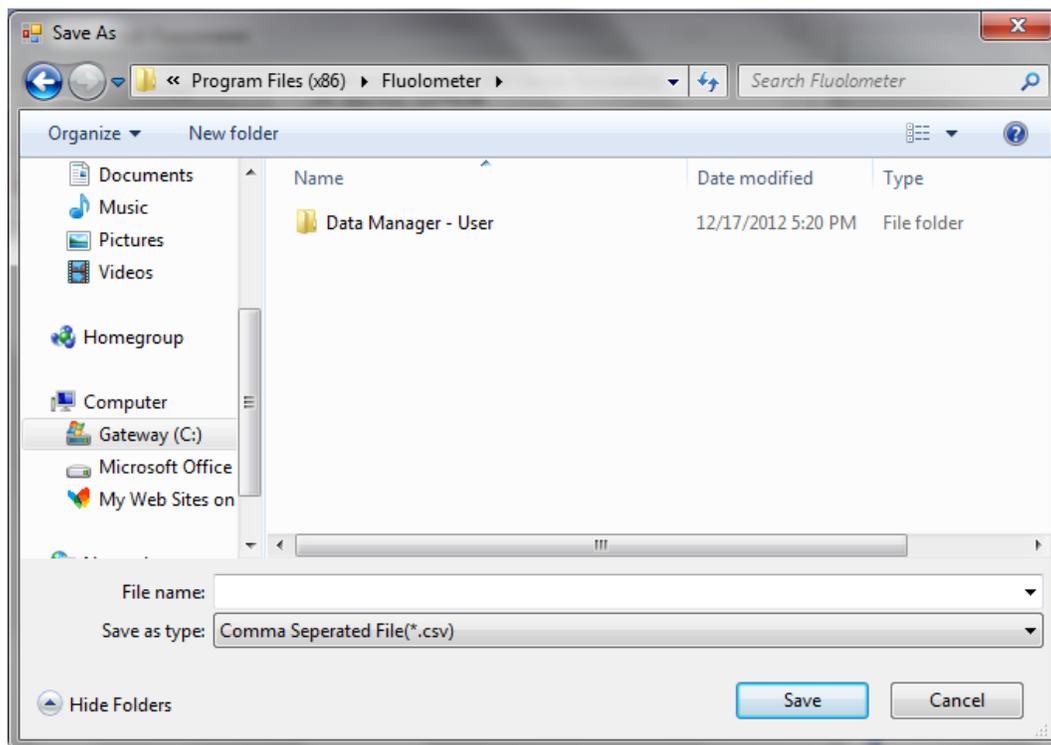


Figure 25. Save As window

## 6. Technical Specifications

Technical Index	Specifications
Power Supply	4 AA batteries or a 5VDC adapter
User Interface	LCD Touch Screen
Data Output	USB Port
Sample Tube	200 µl PCR tube, or glass min-tube
Warm-Up Time	Less than 10 seconds
Dimensions	185mm x 90mm x 35mm
Weight	10 oz (0.28kg)

## 7. Menu Tree

